

REMARKS

This responds to the Office Action mailed on July 25, 2006.

Claims 1-24 are cancelled without prejudice. Applicant reserves the right to reintroduce them at a later date. Claims 25 - 48 are added. As a result, claims 25 – 48 are now pending in this application.

Rejections to the previous claims are now addressed in the context of the new claims to assist with examination of the application.

§112 Rejection of the Claims

Claims 1, 8, 9, 10 and 20 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. This rejection is believed moot.

§103 Rejection of the Claims

Claims 1-5 and 7-21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Onischenko (WO 02/079863 A2) in view of McCaughan et al. (U.S. 6,545,791 B1). Each of the new claims specifically refers to a structure where a p-i-n diode is formed with an optical resonant or resonator cavity serving as the “i” portion of the diode. This structure allows the control of the refractive index of the resonator by controlling the carrier concentration within the resonator.

Onischenko does not describe a p-i-n diode, and clearly follows the background section of the present application by using a Joule effect to change the refractive index of a resonator or the use of a PN diode, without the intrinsic or “i” region using the Peltier effect to change the refractive index. These are both significantly different than that claimed in the present application because they both involve the use of heat to change the refractive index.

The Final Office Action points to Onischenko at page 10, lines 19-24 as describing a PIN diode. This assertion is respectfully traversed. In the first sentence cited starting on line 19, Onischenko writes, "Alternatively the heater may be implemented by two similarly doped regions on opposite sides of the waveguide separated by the intrinsic silicon of the waveguide as described in GB 9815655.7." Note the use of the phrase 'similarly doped' meaning that the

doped regions have the same doping. This is made clear by referring to the referenced patent which states: "Each of the doped regions 20 may be formed of a P-type dopant or they may each be formed of an N-type dopant." In other words, the device uses either two n-doped regions or two p-doped regions, not one n⁺ region and one p⁺ region; thus, this is not a p-i-n diode. Nor is it obvious that one should change one of the two doped regions to the opposite type of doping because there is no teaching that such a design would not be useful for heating the cavity.

The second sentence of the referenced text in Onischenko states: "It is also possible for the PSE (phase shifting element) to be in the form of a Peltier device in which heating is effected at a junction between two dissimilar materials, for example at a junction between p-doped and n-doped regions of the silicon layer, due to the Peltier effect." In this suggested embodiment of Onischenko, the p⁺ and n⁺ regions touch, and are not separated as in a p-i-n diode. Again, this is not a p-i-n diode, and again, it would not be obvious to separate them with an insulator because the resulting p-i-n diode would not be useful for heating the cavity.

Claims 6 and 22-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Onischenko (WO 02/079863 A2) in view of McCaughan et al. (U.S. 6,545,791 B1) as applied to claims above, and further in view of Comfort et al. (U.S. 5,308,785). This rejection is believed moot in view of the above remarks, and further in view of the claims being cancelled.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (612) 373-6911 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

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Date October 18, 2006

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop RCE, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 18th day of October 2006.

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